

NAVAL WAR COLLEGE
Newport, R.I.

THE SUBMARINE CONTRIBUTION TO OPERATIONAL PROTECTION

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction for the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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19 May 1997

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19970815 045

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REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: G		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): The Submarine Contribution to Operational Protection (U)			
9. Personal Authors: CDR Dale R. Govan, USN			
10. Type of Report: FINAL		11. Date of Report: 19 May 1997	
12. Page Count: 23			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
Ten key words that relate to your paper: Operational protection, Submarine, Littoral threat, Stealth, Battlespace dominance, Submarine employment doctrine.			
<p style="text-align: center;">15. ABSTRACT</p> <p>How can nuclear powered submarines (SSNs) contribute to joint force protection? Are these submarines essential to a joint force commander's concept of operations? Would their absence significantly alter his branch and sequel plans? Although SSNs represent a significant combat capability, do they possess the necessary range of capabilities to enhance operational protection in a given theater?</p> <p>SSNs can be a force multiplier in the right scenario. "The modern attack submarine is a versatile multi-mission warship that is more survivable than any other naval vessel in history." However, just as the special operating forces complement ground troops, SSNs complement the naval forces. SSNs can not accomplish all tasks all the time, but the capabilities they bring to joint force operations can free other forces to act in contributing areas to accomplish the overall mission. This is their forte.</p> <p>The principle missions submarines can perform have grown tremendously from the pre-World War II tasks. These tasks included covert strike warfare, surface warfare, undersea warfare, intelligence collection and surveillance, covert indication and warning, electronic warfare, special warfare, covert mine warfare, and battlegroup support. With so many capabilities available, the operational commander must rely on doctrine to incorporate these tasks into his concept of operations. This paper will attempt to articulate the fundamental principles to guide the use of SSNs in warfare.</p> <p>Just as air superiority against an adversary requires phasing of operations, so does undersea superiority. Submarines can best combine time and space with stealth to help prepare the littoral battlespace for future operations.</p>			
16. Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

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SSNs can be a force multiplier in the right scenario. "The modern attack submarine is a versatile multi-mission warship that is more survivable than any other naval vessel in history."¹ However, just as the special operating forces complement ground troops, SSNs complement the naval forces. SSNs can not accomplish all tasks all the time, but the capabilities they bring to joint force operations can free other forces to perform tasks in contributing areas within the theater of operations. This is their forte.

The principle missions submarines can perform have grown tremendously from the pre-World War II tasks. These tasks included covert strike warfare, surface warfare, undersea warfare, intelligence collection and surveillance, covert indication and warning, electronic warfare, special warfare, covert mine warfare, and battlegroup support.² With so many capabilities available, the operational commander must rely on doctrine to incorporate these tasks into his concept of operations. This paper will attempt to articulate the fundamental war-fighting principles to guide the use of SSNs in joint warfare.

Just as air superiority against an adversary requires phasing of operations, so does undersea superiority. Submarines can best combine time and space with stealth to help prepare the littoral battlespace for future operations.

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“In regional conflicts, the Navy must emphasize the ability to project power ashore with minimum risk to our forces. Those who must plan for future regional conflicts should recognize the historical role of the submarine as a force multiplier. Submarines have operated in support of nearly every regional conflict or crisis faced by this nation in the past 50 years, including the Korean War, Vietnam, Grenada, Lebanon, and Libya, as well as Desert Shield and Desert Storm.”³

Vice Admiral Roger F. Bacon, USN

Introduction

Protection of one's own and friendly forces is an important function of operational art. It is a substantial concern for any joint force commander (JFC). Protection conserves the fighting potential of a force so that commanders can apply it at the decisive time and place.⁴ Operational protection is much more than passive defense and begins well before any force deployment or subsequent engagement. If SSNs are to effectively contribute they must be integrated into the plan to support the national military strategy of peacetime engagement; deterrence and conflict prevention; and fighting and winning national wars. These strategies require a significant maritime involvement, and submarines must be able to contribute to not only unit or service specific protection, but also to the overall joint force protection.

Unified commanders may not always be able to provide overwhelming force to accomplish their assigned missions. Reduced budgets, military force reduction plans, and multiple worldwide commitments will squeeze out capabilities from one theater to another. No military commander ever wants to tell his boss he cannot accomplish the assigned mission given a constrained force mix; however, if adequate forces are not available, it is his

obligation to do so. He must be able to preserve his combat potential until an acceptable force deployment can be applied to the crisis. Combatant commanders in chief (CINC) must have options of military force to bring into the theater to support U.S. national interests, no matter what the current world situation is demanding, as directed by the national command authority. Forces available would have to act to prepare the battlefield for future operations with minimal assistance. Submarines can be an appropriate force to bring a wide range of capabilities quickly to a crisis area and fill a necessary void.

The Threat in the Littorals

Joint Vision 2010 is the Chairman of the Joint Chiefs of Staff vision for the military challenges of the future. In it, four key operational concepts for war fighting are discussed. These concepts are “dominant maneuver, precision engagement, full dimensional protection, and focused logistics.”⁵ Friendly force protection will be challenged by newer sensors, technologies, and more responsive weapons. Battlespace, both undersea and in the air, will gain lethality because of readily available high technology weapons being sold on the world market. Many of these future concepts are applicable today in the littorals. Small coastal navies can purchase smarter weapons with extended reach and increased capabilities. U.S. maritime forces are significantly challenged in these regions. More lethal battlespace has increased the importance of stealth, mobility, dispersion, and pursuit of a higher tempo of operations⁶ making these factors appropriate for today’s military operations.

Many threats to U.S. forces loom in the littorals; land and sea based missile systems, land based aircraft, mines, and submarines are all prevalent. These threats combined with long range detection and targeting systems, confined maneuvering room, a multi-contact

environment, and capable regional navies make dominance of the sea in the littorals as important as dominance in the air. Enabling forces will find operational protection close to shore in support of the ground efforts extremely challenging. Many naval weapons systems were not designed to operate in this type of environment.

Surface ships now in commission were designed with the open ocean and distant defensive perimeters in mind; to keep deploying them to a playing field where under the most optimistic assumptions, their survival requires a normal operating mode of the highest level of *everything, all the time* is unhealthy and unrealistic in the long run.⁷

Another factor making littoral battlespace more lethal are the propagation of mines. "More than 30 countries are actively engaged in... [mine]... development, manufacture, and marketing. Mines can influence the battlespace by channeling, blocking, deflecting, disrupting, or delaying our power-protection."⁸ In the Gulf War two navy ships, the Aegis cruiser *USS Princeton* and the amphibious assault ship *USS Tripoli*, were damaged by Iraqi mines. In addition, the threat of other mines off the coast of Kuwait discouraged an amphibious landing. Sea mine activity will drive the JFC decisions on how to employ expeditionary forces. Branches must be planned to ensure force protection under these circumstances and still accomplish assigned missions. Mine neutralization is very resource intensive, and forces or time may not be available to accomplish the task.

A significant threat in the littoral region are diesel submarines. Obtaining submarines or advanced submarine technology in the world market is available for the right price. Six countries produce export submarines and at least five produce export submarine launched weapons.⁹ Antisubmarine warfare (ASW) is very resource intensive also. The mere fact that

an adversary's submarines are in the area of operations will affect the JFC's operational decisions and planning. Even though diesel submarines are not as maneuverable or capable as SSNs, they can have a negative impact if they damage a high value unit. Essentially, potential targets must come to diesel submarines. "Small maritime states obtain submarines as a means of defense against superior naval forces, especially surface ships."¹⁰

U.S. Naval forces can certainly prevail in the littorals, but superiority may not occur immediately. Time, space, and forces need to be applied in a coordinated plan to dominate the littorals.

Battlespace Dominance in the Littorals

The principals of war provide guidance to the JFC in the conduct of war. These principles are objective, offensive, mass, economy of force, maneuver, unity of command, surprise, security, and simplicity. The SSN combines five of the nine principles of war into one platform.

- Economy of force is the judicious employment and distribution of forces.¹¹ SSNs operate best in small numbers with clear mission directives. No additional protective forces are required for the SSN to conduct operations in the littorals. When the time comes to act, the SSN can be ready to support coordinated operations.
- Surprise, the ability to strike the enemy when he is unprepared, is available through stealth. No additional deception methods or forces are required. When ready, the SSN can employ unexpected combat power to strike decisive points of the enemy.
- Security of the ship comes from inherent stealth and for joint forces through covert intelligence collection in the area of operations. Security assists in the protection of friendly forces by reducing vulnerability to hostile acts, influence or surprise.¹²

- Maneuver places the enemy in a disadvantaged position. "Use of maneuver (mobility) capitalizes on the speed and agility of . . . [the submarine] . . . to gain an advantage in time and space relative to the enemy's vulnerabilities."¹³
- Offensive action is the means by which a military force seizes and holds the initiative while maintaining freedom of action and achieving decisive results.¹⁴ The SSN carries only offensive weapons onboard.

The SSN can assist in accomplishing the objective of an operation and also assist in massing combat power. Mass is the concentration of forces to project overwhelming power at a decisive place and time. These factors will allow the submarine to preserve the JFC's initiative and freedom of action from under the sea. Allowing the JFC to exercise freedom of action helps provide full protection for his forces.

Achieving naval superiority in the littorals not only involves surface superiority, but also air and undersea superiority. Depending upon enemy capabilities, undersea superiority may be part of the phasing of operations. The JFC must decide what critical advantages need to be gained prior to sequencing to the next phase. Critical advantages required for undersea superiority accomplished by the SSN could be searching out specific areas for mines using the high frequency sail mounted sonar, neutralization of enemy ships or submarines, or covert mining of choke points or enemy harbors. The undersea superiority phase can begin well in advance of other forces deploying to the area. Submarines do not require air superiority or protection from cruise missiles. Stealth alone is sufficient, and the SSN may be the platform of choice to begin military operations in the littorals.

The littoral region can be considered the deep operating area, from a maritime perspective, prior to air and sea superiority being achieved. Fighting wars from deep operations helps to apply force throughout the battlespace. Friendly forces remain where

they are best protected until superiority can be gained. Distance from enemy cruise missiles and land based aircraft along with a wide dispersion of forces will provide adequate protection at the beginning of a campaign for maritime forces. The SSN can provide the necessary fires for operations in depth in addition to asymmetrical force against the enemy, sea forces engaging land forces. "JFCs are uniquely situated to seize opportunities for asymmetrical action and must be especially alert to exploit the tremendous combat power of such actions. Asymmetrical operations are particularly effective when applied against enemy forces not postured for attack."¹⁵ The SSN is capable of employing offensive weapons against enemy vulnerabilities both in the littoral waters and against land targets. In the near future, the SSN will be able to provide a quick response, deep attack, ballistic missile capability for high priority battlefield targets. This will be a version of the army tactical missile system modified for the submarine vertical launch system.¹⁶

Rules of engagement (ROE) directly relating to mission accomplishment objectives are essential for the submarine to assist in battlespace dominance. ROE are developed by asking "what if" questions and matching the military actions within the political framework of the situation. Can vessels actively engaged in mine laying be attacked, or under what conditions can they be attacked? Can diesel submarines of the hostile nation be attacked, or must they be within a specified range of friendly forces? Does the operational commander have the authority to covertly mine a particular harbor, approach, or other choke point with submarine launched mines? What essential elements of information obtainable by a sea based platform are necessary in order to execute the operational plan? Answers to these questions will develop ROE to help the submarine shape the battlespace of the littoral

favorably for friendly forces. Battlespace preparation will provide adequate force protection when the operation begins.

The key to battlespace dominance is choosing the right range of forces and options to expose enemy critical vulnerabilities. This needs to be conducted while protecting one's own combat power until it can be employed decisively. Secondary fires and phasing operations may be necessary. The SSN does not require additional protection forces when tasked with missions in the littorals, and hence, acts to free other forces to be employed elsewhere in the theater.

Characteristics of Stealth

Whether an aircraft or submarine, the quality that makes the platform stealthy to an opposing force is the ability to avoid detection by active sensor systems; for example, radar or sonar transmissions. In addition, the significant lack of acoustic, electronic, or thermal emissions during normal operations preserves the platform stealth. For submarines, low observable technology has reduced active acoustic reflections from sonar transmissions with rubber hull coatings, and noise quieting technology has significantly reduced radiated acoustic emissions; the ship's noise signature. The submarine commanding officer selects when and how the SSN employs its active sensors or communications equipment taking into consideration mission tasking, environmental conditions, and enemy capabilities. Stealth is survivability to the submarine.

Stealth, in and of itself, yields tremendous combat potential for a JFC. Stealthy platforms need minimum support to accomplish their mission. They can strike deep inside the battlefield because stealth provides protection. Given specific orders, they can enter

from dispersed positions and mass decisive power in synchronized plans to attack the enemy's centers of gravity.

“ . . . a stealthy platform will perform best in a manner that preserves its low observable properties: working alone or in very small numbers, under mission-type orders, being given considerable latitude in terms of time and space constraints, operating with absolute attention to all aspects of operational security.”¹⁷

SSNs combine stealth with tremendous endurance and sustainability. The ship's logistic load out allows it to remain on station and submerged for extended periods of time; U.S. SSNs have routinely operated on station for up to 75 days. No logistic train or additional support is required making the SSN very independent. The ship can operate at a high speeds for nearly unlimited periods of time providing the operational commander with excellent responsiveness. The SSN is able to deploy to a crisis area quickly and covertly and remain there as long as required. No other warship has this capability

Shaping the Battlefield for Operational Protection

Several factors help to shape the battlefield before the conflict ever begins; these are intelligence collection activities and training exercises. Effective employment of covert all sensor intelligence gathering must start early. “The aim is to integrate and analyze information to evaluate and assess threats and the possibility of attack against one's own and friendly forces.”¹⁸ Collection priorities from the operational commander must be focused on the potential hot spots in his theater. A submarine can exercise the surveillance role across the spectrum levels of conflict. Observation of naval activity in a adversary's back yard is a very effective means of determining capabilities. Maritime forces operate freely; target

platforms or forces do not modify their behavior, because they do not know the submarine is present.¹⁹ In addition to intelligence collection, environmental data collection, and monitoring of normal maritime activity can serve to enhance the area database.

Tasking submarines to operate in areas of potential future conflicts is an excellent opportunity to observe the operational proficiency of the adversary. This is particularly important if the nation operates submarines. U.S. SSNs operating in the right areas before the conflict may be able to determine the adversary's true submarine capabilities. Of the approximately 20 third world nations operating diesel submarines (SSKs) only about half of them are considered proficient. Submarine operational proficiency would certainly be a priority for the CINC's intelligence collection requirements. Many countries are purchasing after sales support to attempt to improve their submarine capabilities. Since the operational experiences of many countries are limited, the submarine threat in the littorals may be overrated.

"Countries such as North Korea, Libya and Iran operate SSKs, but crew skills are low, and such vessels represent little threat to warships. More likely these submarines would attack unescorted merchant ships. The submarine's stealth makes it an ideal terrorist weapon, and modern day submarine piracy is one of those contingency scenarios against which every nation should train."²⁰

"Preparing the theater . . . includes organizing, and where possible, training forces to conduct operations throughout the theater."²¹ Operational commanders must exercise their forces in the right type of operations as part of their peacetime engagement strategy. Limited training time and resources require training operations or exercises be focused on the high probability of conflict areas as much as possible. This certainly does not mean operating on

the ground in hostile countries, but operating with allied or potential coalition forces in the vicinity of possible future conflict areas is feasible. Operating in conjunction with other naval forces, especially those with their own submarine force, is extremely important. Command and control issues, waterspace management for submarines, and environmental factors (area climate, weather, and topography) can be well integrated with force maneuvers and problem areas can be targeted for correction. Lessons learned from exercises of this nature can then be incorporated into existing deliberate plans. In addition, this visible presence in an area indicates U.S. resolve to protect our national interests if necessary. Protection of forces will always occur if multinational operations effectively deter potential adversaries.

Submarine Employment Doctrine

If a JFC is looking for the "operational use of submarines in a joint theater" primer, it does not exist. One reason may be because the Navy has not focused on operational art and its application to maritime operations. The Navy Doctrine Command has only been established since 1993. Another reason is the secrecy surrounding all submarine operations during the Cold War. Not many military members ever knew what submarines were doing. All too often the emphasis has been on the technology built into ships themselves, and not the larger view of application of the technology in a theater of operation. As a group, naval commanders frequently do not articulate the contributions of naval forces well to the combatant CINCs. Too often, the capabilities are expressed at the tactical - operational level of command vice one echelon higher; the joint task force commander instead of the joint force commander. Nuclear powered submarines have been a part of the U.S. Navy for over

40 years; however, they have only recently been employed in carrier task force organizations in earnest. Coordinated battle group operations have only been conducted since about 1992.²²

“The heart of the problem is that no one really seems to know what the submarine is supposed to do for the carrier battle group. Rather than exploring warfighting schemes that maximize the utility of the SSN, most of the involved parties’ time is spent trying out how and when the SSN might best simulate an enemy submarine to provide some undersea warfare practice.”²³

The problem is one of a genuine commitment to joint warfare, both in operations and training. Most naval officers spend a career with extremely limited exposure to joint doctrine. Senior leadership still requests exceptions for the joint training requirements of the Goldwater - Nichols Act, vice trying to adapt to the requirements. Only through the Navy’s sincere commitment to joint warfare, supported with joint education, and emphasis on supporting the ground forces ashore, will the doctrine develop to effectively employ submarines in the joint arena. Development of doctrine is an evolutionary process; however, it must be well defined to evolve. Some basic principles can be applied in planning operations in the littorals to best use the submarine’s stealth to enhance force protection.

Submarines can perform best operating in small numbers, with mission tasking orders that do not require a great amount of two way communications. The joint force commander should attempt to give the submarines as much time and space as possible within other theater constraints. If undersea superiority will be required, then this phase of an operational plan should begin well in advance of any other forces being deployed to the area. The undersea phase should also begin before or in conjunction with the air superiority campaign. If amphibious operations are anticipated, then plans must include phasing or sequencing for

both undersea and air superiority in the theater prior to these operations being conducted. A question will certainly be, "how much time is available to gain the critical advantages of the JFC's operational plan?" Time will drive how quickly all forces must act. Although the SSN can assist in countering diesel submarines, its forte is not just ASW. The best platform to employ for littoral missions is the one that has the right capabilities and the lowest force cost.

Operational fires must be considered. Are preemptive strikes required to reduce mine laying or submarine capabilities? Submarines operate very well with special operating forces and have built a "littoral alliance" with them. "A submarine, which is characterized by stealth provides an ideal platform for the clandestine insertion and extraction of small teams of combat swimmers."²⁴ Both of these forces operating together can initiate covert fires or gather essential intelligence. The covert intelligence collection capability can also assist the JFC strike planners in determining where future fires will be required.

If the hostile nation operates diesel submarines, more time may be required to neutralize the threat. More friendly submarines in the first phase of operations will ensure force protection and help to synchronize the deployment of other friendly forces to the area. Once other forces are in the area submarines may then be given other tasking; for example, protection of littoral flanks or monitoring activity in enemy ports. Coordination of many submarines within a naval task force or expeditionary force becomes a challenge to prevent blue on blue engagements. The principle of "first in, first out"²⁵ can assist in water space management. "Get the SSN where you want it early, have it do its particular task, then get it out early before the arrival of other forces."²⁶ This will free these forces to act for other objectives; for example, as a rear guard or in areas where hostile forces are to be intercepted.

Conclusion

In today's fiscally restrained environment, military capabilities are being stretched to new limits. The range of political solutions involving military operations will continue to grow, as will the public's aversion for casualties. Each piece of hardware, ship, aircraft, or vehicle will become more and more valuable and force protection will become more important. Superior technology may be able to enhance joint force capabilities, but battlespace dominance will be required for success.

Submarines have found intrinsic stealth a valuable asset across the entire spectrum of conflict. As a primary characteristic, stealth provides not only greater probability of mission accomplishment in general war scenarios, but also offers incomparable survivability in third-world conflicts, when domestic intolerance of American casualties becomes a primary constraint on military action.²⁷

Stealth provides protection for the submarine 24 hours a day. The SSN can transit quickly to an area of interest and enter well before hostilities begin. Individual stealthy platforms can operate with relative impunity deep within enemy controlled areas. Once the air or undersea superiority phases of an operation begin, timing and synchronization will be required to meet most objectives.

Signature reduction will enhance the ability to engage adversaries anywhere in the battlespace and improve the survivability of forces who employ it. Stealth will strengthen the ability to accomplish surprise, reduce overall force requirements in many operations, and make forces less visible to an unsophisticated or disoriented adversary.²⁸

Rules of engagement must be clear during the phasing of joint operations and will probably change with time. Transition from pre-hostility to hostility or crisis phase will require different ROE to effectively employ the submarine. Submarines can easily bring the fight to the enemy. Once the surprise of the first strike occurs, friendly forces must be ready to engage the enemy in depth, to dominate the littoral battlespace. Submarine commanders can make effective use of large operating areas, maneuvering independently with specific mission orders. Command, control, and communication techniques must be well developed to preserve the submarine stealth until the time comes to apply decisive force.

Stealth significantly increases the emphasis on planning specific operational employment. That is, one must consider as many contingencies and provide as much permission guidance as possible to greatly reduce two-way communications in support of real time command and control.²⁹

Integration of submarines in joint operations begins with the commander's concept of operations. "In the concept of operations, JFCs describe the overall objectives of the joint force, the missions assigned to components of the force, and how the components will work together to accomplish the mission."³⁰ SSNs can provide tremendous capabilities to enhance force protection. Surveillance and intelligence collection can shape the battlespace both before and during a conflict. Covert operational fires will provide regional sea denial and may deter the enemy from further action, or begin to weaken him by attacking his centers of gravity. Unfortunately, in third world nations deterrence may come only after the use of force. The application of covert decisive force has the advantage of surprise and can have a

significant impact to demoralize the enemy. Once demonstrated, the enemy may be more convinced to cease his actions; deterrence must be placed in the mind of the adversary.

Submarines must be part of the joint force training exercises in potential areas of operations before the conflict begins. This will not only enhance command and control techniques with the JFC staff, but also will better prepare submarine crews for future operations in this particular area. SSNs must be assigned to missions they can do best. The missions need not be bounded by Cold War thinking. Submarines can provide ASW missions, but can perform a multitude of other missions also. Matching the mission with the platform will help to preserve the JCF's scarce resources and best satisfy the protective force structure. The submarine force has been performing this type of mission for many years and has been very successful.

Joint Publication 3-0 for joint operations states, "logistics is crucial for phasing."³¹ The submarine can easily transition from one phase to the next without any additional support. The key to phasing air, surface, and undersea superiority will be to identify the critical advantages necessary prior to going to the next phase. The SSN can continue to conduct operations in the littorals, regardless of other forces available because of its inherent stealth. Just as other joint forces have their forte or unique capabilities to bear on force protection, the submarine must be given the reasonable and achievable tasks to take advantage of its unique characteristics. Objectives are accomplished and enhanced by the SSN's inherent stealth. "History shows the advantage belongs to the stealthy."³²

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